

On a new Form of Cephalopodous Ova.
By CUTHBERT COLLINGWOOD, M.A., F.L.S., &c.

(PLATE I.)

[Read February 3, 1870.]

THE large grape-like masses which constitute the ova of the common Cuttlefish (*Sepia*), are of so remarkable a form, and so commonly met with, that they attracted attention very long since. Aristotle, whose acquaintance with the reproductive bodies of the Tetrabranchiates was not far behind that of the present day, was no stranger to these large and singularly formed bodies; and they are commonly taken as the type of the spawn of Cephalopods. But the ova of this group differ considerably in size and appearance, as well as in the numbers produced by a single individual. In the case of *Sepia*, nature seems to have taken special care to preserve these important bodies, having encased them in a flexible horny covering, prolonged at one extremity into a kind of tendril or filament, which entwines round some fixed object which serves an anchorage. In the Poulp (*Octopus*), Aristotle informs us that a shell, or some such convenient *nidus*, receives the eggs, which adhere to it and are thus in some degree, at least, protected from injury. In *Loligo*, &c., great numbers of ova are produced: cylindrical sheaths of a gelatinous consistence are formed, each about 4 inches long and about $\frac{1}{4}$ inch in diameter, and tapering at the free ends, the opposite ends being all attached to some foreign body by filamentary processes from $\frac{1}{2}$ an inch to an inch in length. In each of these radiating bodies there may be 200 capsules, each of which contains from 30 to 40 minute spherical ova. In *Sepioteuthis* there appears to exist an intermediate form of ova, which connects the radiating sheaths of *Loligo* with the large capsular ova of *Sepia*. The ova are (as in *Loligo*) spherical, and enveloped in sheaths; but, as in *Sepia*, these are fewer and longer; while in the Di-branchiates the ova occupy a considerable space at the bottom of the shell, as, for example, in *Argonauta*.

In none of these, however, which represent the characters of of the Cephalopodous ova, as far as known, is there any approach to the characters of a remarkable body which I recently discovered in the Atlantic Ocean, the nature, however, of which was incontestable. We were becalmed in lat. 37° N. and

long. 28° W., and the sea was swarming with beautiful objects, which I was watching from the chains, and making attempts to capture therefrom, when I saw an object which at once withdrew my attention from all the rest (the most familiar illustration I can give of its appearance would be to liken it to one of those cylindrical knitted comforters worn by ladies)—about 2 feet long and about 4 or 5 inches in diameter, closed at both ends, and floating expanded upon the surface of the water. The folds of the web were of a dark colour; and the web itself looked extremely delicate, so much so that, except at these apparent folds, it could scarcely be distinguished at all. At the same time I thought I should be able to hook it up entire, and fetched a grapnel for that purpose. I should have ill succeeded in the attempt, however, as it turned out; but the ship being at this juncture getting up steam and nearly ready to move, the first Lieutenant, Mr. Stewart, kindly lowered a boat for me as it drifted past. From the boat it could scarcely be perceived; and when, by directions from the deck, it was ultimately found, some difficulty was experienced in getting it into the water; for, although it had appeared very solid and distinct in the water, it proved impossible to *drag* it up, and at the first attempt the mass slid away from the bucket placed under it, and, being so evenly balanced, disappeared, and could not be found again immediately. I was sadly afraid it would be lost; for our vessel was only waiting for the boat's return to steam away. Presently, however, it was found again; but in attempting to push it into the bucket, it broke in halves. Ultimately one of the halves was secured; and this was quite sufficient for the purpose. On close examination I was surprised to find that it consisted of a large mass of semisolid, perfectly transparent jelly; and what appeared to be the dark folds of the web were rows or clusters of round black spots, each of the size of a large pin's head, arranged in single rows along the outer part of the cylindrical mass of jelly, the rows not being regularly distributed, but running partially round its circumference, some for a longer distance than others. In some cases, two or three rows were placed close together side by side, and were separated by an interval from the next series, which might contain two or three rows or only one row of spots.

The spots appeared to be most thickly clustered about the edges of the body as it lay in the bucket, and least numerous

upon the central parts—an effect more apparent than real, and depending upon the cylindrical form of the mass. Although only half of the original mass was secured, the soft jelly having divided in getting it into the bucket, it had the appearance of an entire body, the fracture of the gelatinous mass not interfering with its symmetry.

Turning my attention now to the black spots, I at once saw, even without the aid of a lens, that they were egg-sacs containing young Cephalopods. These were extremely active, moving freely in the sacs and contracting their bell-shaped bodies as they leaped about in their narrow chambers. Each egg-sac was perfectly spherical and transparent, the circumference alone being visible, and was imbedded in the soft gelatinous transparent mass just as is the case with the spawn of the frog. The dark-coloured spots were entirely due to the coloured bodies of the embryo animals, which, in most cases, appeared to be just ready to be extruded. On placing the embryos under the microscope, I found that some of them were almost transparent, and exhibited their internal organization. The external surface of the bell was covered with epithelium of columnar form; and the same structure also extended over the arms. The bell was covered with dark-coloured spots—which in the most immature specimens were mere minute round specks, becoming in a further advanced condition irregular and angular as well as of a larger size. The eyes were large and prominent, and seated upon short and thick footstalks, and their dark pigmentary substance was distinctly visible through the transparent bell of the younger individuals. The arms were short, covered with epithelium upon the convex side, and having a few rudimentary acetabula upon their concave surfaces. Upon the upper part of the bell, on either side, was a small fin-like projection, visible even in the least-mature specimens.

Having secured this curious body, and examined its general form and appearance, and placed some of the embryos under the microscope, I was under the necessity of leaving it in a bucket of sea-water for two or three hours. When I returned to it at the expiration of that time, it appeared to have vanished. In some astonishment, I put my hand into the water, and found therein a large mass of soft transparent jelly, entirely invisible in the water. On closer inspection, I discovered that every one of the young embryos had been discharged from its sac, and that they

were lying in little heaps at the bottom of the bucket, either dead or dying. They had entirely lost the active movements which had at first distinguished them; and an occasional contraction of the bell was the only sign of life which any of them exhibited. Those which I had myself separated from the mass, and previously placed in a tumbler of water, were by far the most lively; and from these the accompanying figures were made.

On no other occasion did I meet with a body of this nature; and the only thing I ever saw approaching to it in form was in the Indian Ocean, north of the Equator, when I one day observed something of the kind pass by, which had been a puzzle to me ever since; for the rate at which we were steaming (ten knots) rendered it impossible to take any accurate note of it. Nor should I have been able to guess the character of the body I have here described, had I not been so fortunate as to secure it for closer examination.

The very great contrast which this body offers to the known forms of the spawn of Cephalopods in general is very remarkable; and its singular resemblance to the spawn of the Amphibia is no less worthy of attention. What this may signify is a matter of interesting consideration. The embryo stages of this animal (of which I have preserved a few) will, of course, offer some, though a very imperfect, clue to its adult form, and to the determination of its genus. The presence of fin-like projections upon the upper portion of the bell seems to point out its separation from the genera *Eledone*, *Octopus*, *Tremoctopus*, and *Argonauta*, though to which of the pinnated genera (*Histioteuthis*, *Sepiola*, *Rossia*, *Sepia*, *Sepioteuthis*, *Verania*, *Onychoteuthis*, *Enoplateuthis*, *Loligo*, and *Loligopsis*) it may belong, or whether to some new genus, cannot now be determined. The body was evidently perfect in itself, and perfectly symmetrical; and it is curious to observe so large a mass, and such a vast quantity of animals as the product of a single individual. Probably in it, as in the Frog during the breeding-season, the ovaries occupy the greater part of the body; and probably, also, as is the case with the Frog, when the ova are deposited in the water, the jelly-like substance in which they are enveloped absorbs a large quantity of the fluid, so that the whole mass rapidly increases in volume until it becomes many times as large as the animal from which it was expelled.

These interesting questions may, it is hoped, yet be elucidated, and the affinities of the animal determined. In the mean time I have thought it best to bring forward the fact for the information of zoologists and physiologists.

DESCRIPTION OF THE PLATE.

A, natural size of ova. B, C, young cuttles under a 2-in. object-glass (24 diam.).
D, an embryo, as seen under a 1-in. glass. E, F, arms ($\frac{1}{4}$ in.), showing the rudimentary acetabula.

Description of some new Species of Annelida and Gephyrea in the Collection of the British Museum. By W. BAIRD, M.D., F.R.S., &c.

[Read April 7, 1870.]

ANNELIDA.

1. *NEPHTHYS MACANDREWII*, Baird.

Body elongate, tapering towards the inferior extremity, which terminates in one rather long seta. The sides containing the dorsal feet strongly ridged across. Proboscis rather short and rounded. Setæ of upper lobe of feet few in number and serrated near the tip; rather shorter and broader than those of ventral lobe, which are numerous and not serrated on the edges. Colour of the dorsal region, in the centre, of a pinkish hue.

Length about 6 inches.

Hab. Coruña, R. M'Andrew and H. Woodward, Esqs.

2. *NEPHTHYS IMPRESSA*, Baird.

Body of a yellowish colour. Dorsal and ventral regions smooth, of a pearly, somewhat iridescent hue. Ventral surface marked with a bluish impressed line in the centre. Head small; antennæ indistinct. Proboscis rather long, cylindrical. Papillæ on the summit of it, round the mouth, rather large and fleshy, disposed in a series of 12 on each side. Feet on upper part of body small and close-set, becoming larger and more separate as they descend. Lamellæ ovate. Setigerous lobe rather large. Superior branchial process involute, large, twisted once and a half round. Setæ of setigerous lobe of three kinds:—one, short, curved at the tip and beautifully and minutely jointed; a second, simple, long, and slightly serrated on the outer edge; and the third, long, compound, the edges of the appendage minutely toothed on the edge, as is also the top of the shaft.

This species resembles very much the *Nephtys longisetosa*,

